BULLETIN OF MISCELLANEOUS INFORMATION No. 8 1929
ROYAL BOTANIC GARDENS, KEW

XLI.—THE CORRECT SPELLING OF CERTAIN GENERIC NAMES: V.* T. A. SPRAGUE.

The correct spelling of a few additional generic names has been determined by the writer in response to enquiries from various sources.

Aethionema *R. Br.* in Ait. Hort. Kew. ed. 2, iv. 80 (1812). *Oethionema* Knowles et Westcott, Floral Cabinet, i. 41 (1837). *Ethionema* Brongn. Enum. Gen. 92 (1843); † ed. 2, 149 (1850). *Aëtheonema* Rouy et Fouc. Fl. France, ii. 96 (1895); Bub. Fl. Pyren. iii. 244 (1901). *Aëthionema* Thell. in Hegi, Ill. Fl. Mittel-Eur. iv. 1 Hälfte, 110 (1913).—The original spelling published by Robert Brown stands, although *Aëthonema* or *Aëthionema* are philologically preferable.

Amelanchier *Medik.* Phil. Bot. i. 135 (1789). *Amelancher* Bub. Fl. Pyren. ii. 580 (1900). *Amelancus* Franz Mull. ex Vollm. Fl. Bayern, 453 (1914).

Antholyza *L.* Sp. Pl. ed. 1, 37 (1753); Gen. Pl. ed. 5, 24 (1754). *Antholiza* Neck. Elem. iii. 172 (1790). *Antholysa* Jaume St. Hil. Expos. i. 148 (1805). *Antholyssa* Aschers. et Graebn. Syn. Mitteleur. Fl. iii. 574 (1907).—Linné seems deliberately to have changed the philologically preferable spelling *Antholyssa*, formerly employed by him, to *Antholyza*. This and the two preceding cases were brought to the writer's notice by Dr. A. Becherer.

Chamorchis *L. C. Rich.* in Mém. Mus. Hist. Nat. Paris, iv. 42, 49, 57 (1818). *Chamaeorchis* Koch, Syn. Fl. Germ. Helv. 692 (1837).—It is regrettable that Richard should have altered the name *Chamaeorchis* (*Camaeorchis*) C. Bauh. (Prodr. 29: 1620; Pinax, 81, no. x.: 1623) to *Chamorchis*, which is philologically less correct. As he deliberately chose the latter spelling, however, it must be retained under the Rules.

Daboecia *D. Don* in Edin. New Phil. Journ. xvii. 160 (1834). *Dabecia* Spach, Hist. Veg. ix. 472 (1840). *Dabeocia* K. Koch, Dendrol. ii. Abth. 1, 132 (1872). *Daboëcia* Dalla Torre et Harms, Gen. Siphonog. 381 (1903).—Linné latinized St. Dabeoc's name as "Daboecius" in *Erica Daboecii* L. Sp. ed. 2, 509 (1762), and in

*See *K.B.* 1928, pp. 113, 285, 337; 1929, p. 38.
†Not seen by the writer.

Andromeda Daboecia L. Syst. Nat. ed. 12, 300 (1767). D. Don chose Linné's specific epithet *Daboecia* as a generic name, and his deliberately chosen spelling cannot be altered, under the International Rules. There is no justification for the diaeresis : both Linné and D. Don employed a diphthong.

Gerberia *Cass.* in Bull. Sc. Soc. Philom. Paris, 34 (1817), nomen ; et in Dict. Sc. Nat. xviii. 460 (1820), descr. *Gerbera* Spreng. Syst. iii. 575 (1826).—The generic name is conserved as "*Gerbera* Cass. in Bull. Soc. Philom. (1817) 34," but this citation is inaccurate : Cassini called it "*Gerberia*." It should be made clear in the list of conserved names whether the spelling *Gerbera* is conserved, or the name *Gerberia* Cass. The writer is indebted to Prof. C. E. Moss for this example.

Huernia *R. Br.* in Mem. Wern. Soc. i. 22 (1809). *Heurnia* Spreng. Anleit. ed. 2, ii. Abth. 1. 488 (1817).—Robert Brown "named the genus in memory of Justus Heurnius, one of the earliest collectors of Cape plants and from whose drawings the first account of *Stapelia* was taken." He deliberately adopted the spelling *Huernia* for the genus, doubtless because it was more euphonious than *Heurnia* : the name occurs as *Huernia* on the table facing p. 19, and in a remark on p. 23 under *Piaranthus* as well as on p. 22. Under Art. 24, Brown was at liberty to form the new generic name as he pleased, and under Art. 57 the original spelling *Huernia* must be retained. In the light of Brown's action in regard to *Huernia*, it now seems probable that the spellings *Malcomia* and *Mathiola* (*vide* Kew Bull. 1928, 356, 357) were deliberately chosen by him.

Kutchubaea *Fisch. ex DC.* in DC. Prodr. iv. 373 (1830) ; G. Don, Gen. Syst. iii. 492 (1834) ; Meisn. Gen. 161, Comm. 115 (1838) ; Endl. Gen. 563 (1838) ; Spach, Hist. Veg. viii. 372 (1839) ; Endl. Enchirid. 275 (1841) ; Reichb. Nomencl. 78 (1841). *Kotchubaea* Regel ex Benth. et Hook. f. Gen. Pl. ii. 98 (1873) ; K. Schum. in Mart. Fl. Bras. vi. pars 6, 396 (1889) ; et in Engl. et Prantl, Pflanzenfam. iv. Abt. 4, 84 (1891). *Kotchubea* Baill. Hist. Pl. vii. 436 (1880). *Kotschubeya* Post et Kuntze, Lexic. Gen. Phan. 310 (1903).

Fischer, who proposed the name *Kutchubaea* in a letter to De Candolle, took no steps during the 24 remaining years of his life to correct the spelling, so that he may fairly be assumed to be responsible for it. The name *Kutchubaea* remained unaltered from 1830 till 1873, when Bentham and Hooker changed it to *Kotchubaea* on hearing from Regel that the person to whom the genus was dedicated was Prince Kotchube (not Koutchoube as given by De Candolle). Fischer, however, presumably knew the correct spelling of the name, and he chose to latinize it as "Kutchubaeus." Consequently no alteration is admissible in the original spelling *Kutchubaea*.

Pithecellobium *Mart.* in Schrank et Mart. Reg. Monac. 188 (1829) ; sine descr. *Pithecollobium* Mart. in Flora, xx. Band ii. Beibl. 114 (1837). *Pithecolobium* Benth. in Hook. Lond. Journ. Bot. iii. 195 (1844). There is no doubt that Martius originally formed the generic name *Pithecellobium* from πίθηκος, monkey and ἐλλόβιον, ear-ring. Why he subsequently changed it to *Pithecollobium*, while retaining the same derivation, is not apparent, and as the latter spelling may have been due to a lapsus calami or a typographical error, the first spelling used by Martius should be retained. There is no justification for *Pithecolobium*, derived from λόβιον, a diminutive of λοβός, the lobe of the ear. The name is conserved as "*Pithecolobium* Mart." which is inaccurate. In this, as in similar cases, the spelling employed in Dalla Torre et Harms, Gen. Siphonog. was copied.

Sacoglottis *Mart.* Nov. Gen. et Sp. ii. 146 (1827). *Saccoglottis* Endl. Gen. 1040 (1840).—The generic name seems to have been derived from σάκος (more usually spelt σάκκος), a sack, and γλωττίς a little tongue, in allusion to the tongue-like connective separating the two thecae of the anther. There was therefore no unintentional orthographic error in the name *Sacoglottis*, and it must stand as published by Martius.

Simarouba *Aubl.* Hist. Pl. Guiane Franç. ii. 859, tt. 331, 332 (1772). *Simaruba* DC. in Ann. Mus. Par. xvii. 423 (1811).—Aublet adopted the Carib name "Simarouba" for the genus, and that spelling must be retained under Art. 50.

Stenorynchus *L. C. Rich.* in Mém. Mus. Par. iv. 59 (1818). *Stenorrhynchos* Spreng. Syst. iii. 709 (1826). *Stenorrhynchus* Reichb. Consp. 67 (1828). *Stenorrhynchium* Reichb. Nom. 55 (1841). *Stenorhyncus* Lindl. in Benth. Pl. Hartweg. 92 (1842). *Stenorhynchus* Lindl. in Ann. & Mag. Nat. Hist., ser. 1, xv. 386 (1845).

XLII.—THE IRIDACEAE OF BURMANN'S FLORAE CAPENSIS PRODROMUS : II.

N. E. Brown.

In the account of The Iridaceae of Burmann's Florae Capensis Prodromus (*Kew Bulletin* 1929, pp. 129-139), I had intended to add a note under *Gladiolus angustus* Burm. (p. 131) concerning *G. Watsonius* Thunb. to the following effect.

In the Flora Capensis vi, 169, Baker has confused two plants under the name of *Antholyza revoluta* Burm., under which *G. Watsonius* Thunb. is placed as a synonym. One of these was separated in 1903 by Dr. H. Bolus in Trans. S. Afr. Phil. Soc. xiv, 336, under the name of *Gladiolus Watsonius* Thunb. and a description of it there published. This plant in 1920 was transferred to the genus *Antholyza* as *A. Watsonius* L. Bolus in Ann. Bolus Herb. iii, 11, and in the Kew Herbarium there are several specimens of it named by Mrs. Bolus herself, so that there can be no doubt about

the plant intended by that name. But it is not the same as *G. Watsonius* Thunb. and cannot retain that name. I therefore propose for it the name *Antholyza Priori* N.E. Br., after Alexander Prior, who appears to have been one of the earliest to collect this species. The synonymy will be :—

Antholyza Priori *N.E. Br.—A. Watsonius* L. Bol. in Ann. Bol. Herb. iii, 11. *A. revoluta* Baker in Fl. Cap. vi, 169, partly, not of Burmann. *Gladiolus Watsonius* Bolus in Trans. S. Afr. Phil. Soc. xiv. 336, and Fl. Pl. S. Afr. vi. t. 240, not of Thunberg.
Near Cape Town, *Prior* ! (type). Steenberg Rocks, *Wolley Dod* 1135 ! Lion Mountain, *Mac Owan, Herb. Norm.* 289 !

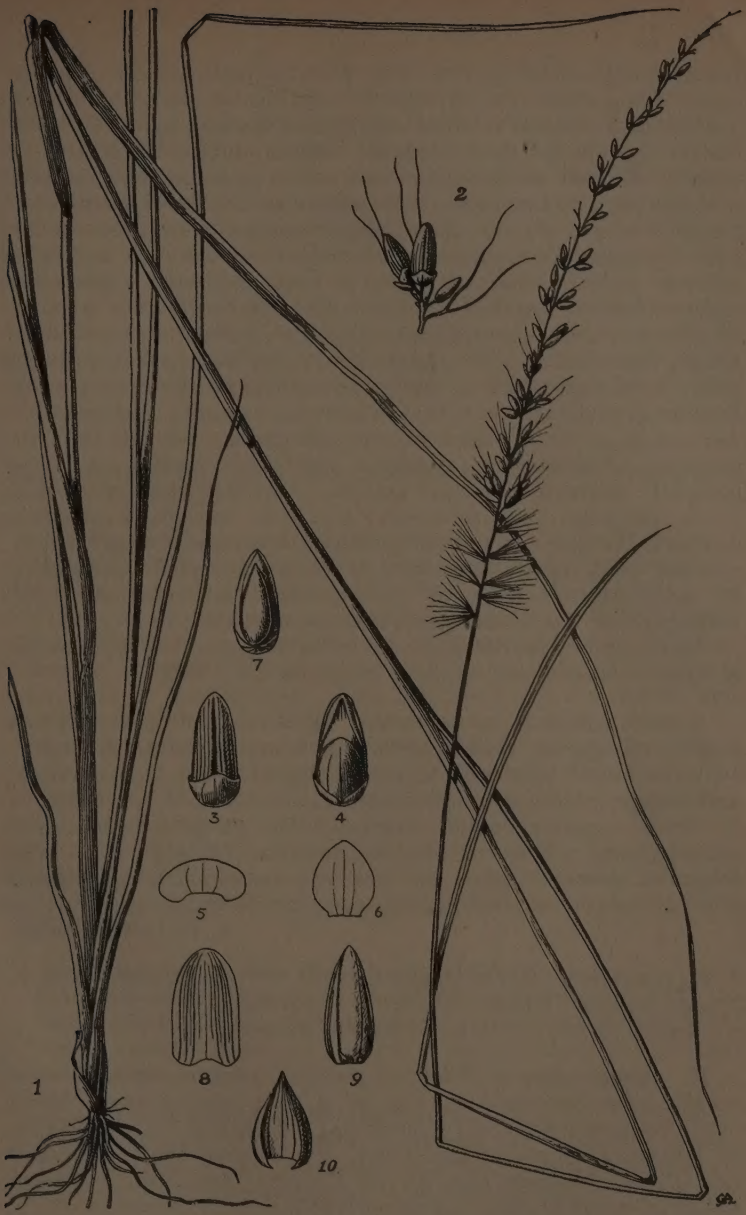
The other species is the true *Gladiolus Watsonius* Thunb. and is the plant still called *Antholyza revoluta* by South African botanists. But from Burmann's description of that species—" Staminibus adscendentibus, corollis revolutis, foliis lanceolatis nervosis " it cannot be that species, for the leaves are neither lanceolate nor full of nerves, nor is the corolla revolute. But as the true *A. revoluta* Burm. (loc. cit. p. 131) is at present unknown, I propose that the following be taken as the name and synonymy of *Gladiolus Watsonius* Thunb., of which the specific name is evidently an error for *G. Watsonianus*.

Antholyza Watsoniana *Pax* in Engl. & Prantl, Pflanzenfam. ii. 5, p. 156. *A. revoluta* Baker in Fl. Cap. vi, 169, partly, not of Burmann. *Gladiolus angustus* Burm. Fl. Cap. Prodr. 2, not of Linné. *G. Watsonius* Thunb. Diss. Glad. 14, & Fl. Cap. ed Schultes, 41, excluding other references.
Near Cape Town on Lion Mountain, etc. *Thunberg* ! *Ecklon* 11 ! *Bolus* 3729 ! Piquetberg Road, *Schlechter* 4841 !

XLIII.—A NEW GENUS OF GRASSES. O. Stapf & C. E. Hubbard.

Holcolemma *Stapf et Hubbard*, gen. nov. ; affinis *Setariae* P. Beauv., sed spiculis basi obliquis leviter saccatis, glumis laxis hyalinis vel tenuiter membranaceis nervis 3–5 tenuissimis percursis, lemmate anthoecii inferi leviter saccato in dorso anguste sulcato, sulco tenuissimo facile scisso, ad sulci latera utrinque nervis 2–6, palea anthoecii inferi inter carinas hyalina atque alte depressa extra carinas demum indurata, carinis et marginibus maturitate anthoecium superum amplectentibus, anthoecii superi lemmate paleaque tenuiter crustaceis differt.

Spiculae a dorso visae lanceolato- vel ovato-oblongae vel oblongae, acutae vel obtusae, a latere oblique lanceolatae vel oblongae, leviter saccatae, in dorso planae et medio anguste profunde sulcatae, cum pedicello articulatae, fasciculatae vel nonnunquam solitariae, in rhachi paniculae contractae spiciformis ortae. *Anthoecia* bina ; inferum sterile vel ♂ ; superum ♀. *Glumae* solutae, hyalinae vel tenuissime membranaceae ; inferior late ovata vel rotundata, obtusa,



Holcolemma transiens Stapf et Hubbard. 1, Plant (natural size). 2, Cluster of spikelets (× 3). 3 and 4, Spikelets, front and back view respectively (× 6). 5, Lower glume (× 6). 6, Upper glume (× 6). 7, Spikelet with glumes removed (× 6). 8, Lemma of lower floret (× 6). 9, Palea (× 6). 10, Lemma of upper floret partially opened out (× 6).

tenuissime 3-nervia, quartam vel tertiam partem spiculae aequans; superior late ovato- vel elliptico-oblonga, obtusa, nervis tenuissimis 3–5 percursa, tertiam vel dimidiam partem spiculae aequans. *Anthoecium inferum* spiculam aequans; lemma ambitu lanceolato- vel ovato- oblongum vel oblongum, basi leviter saccatum, in dorso sulco mediano angusto tenuissimo facile scisso percursum, caeterum firme membranaceum, 5–13-nervium; palea lemma aequans, lanceolato- vel ovato-oblonga, bicarinata, inter carinas admodum concava et hyalina, carinis marginibusque demum induratis. *Anthoecium superum* inferum aequans vel plerumque paulo brevius, dorso lanceolatum vel ovatum, acutum vel acuminatum, a latere oblique lanceolatum, maturitate carinis marginibusque induratis paleae anthoecii inferi amplexum; lemma maturum tenuiter crustaceum, 5-nerve, tenuiter granulatum vel delicate transverse rugosum; palea lemma aequans et ei similis, apice excepto marginibus angustis lemmatis amplexa. *Lodiculae* 2, minutae, glabrae. *Stamina* 3. *Styli* distincti; stigmata lateraliter exserta. *Caryopsis* elliptico-oblonga, dorso compressa, hilo subbasali; scutellum caryopsem dimidiam aequans.—Gramina annua vel perennia; foliorum laminae lineares; spiculae fascicularum inferiorum setis tenuibus mollibus suffultae vel setis substitutae vel (*H. canaliculatum*) inferiores aut omnes nudae, et tunc axi nonnunquam in setam abeunte.

Species 2, in East Africa, South India and Ceylon. Type species, *H. canaliculatum* (Nees) Stapf et Hubbard.

Gramen annuum, culmis erectis; ligula membranacea, ad 2 mm. longa; spicularum fasciculae inferiores multisetosae vel omnino ad setas flavas redactae; lemma anthoecii inferi 9–13-nervium: anthoecium superum acuminatum.....1. *H. transiens.*

Gramen perenne, culmis e basi nodulosa plerumque geniculato-ascendentibus; ligula ad seriem ciliorum redacta; spicularum fasciculae omnino nudae vel seta terminatae; lemma anthoecii inferi 5–7-nervium; anthoecium superum acutum.....
2. *H. canaliculatum.*

1. **H. transiens** *Stapf et Hubbard*, comb. nov.—*Setaria transiens* K. Schum. in Engl. Pflanz. Ost-Afr. C. 105 (1895).

KENYA COLONY: Masai highlands, *Fischer* I. 92!

2. **H. canaliculatum** *Stapf et Hubbard*, comb. nov.—*Panicum canaliculatum* Nees in Wight Cat. 95, n. 1624 (1833) nomen; Steud. Syn. Pl. Glum. i. 55 (1854); Hook. f. Fl. Brit. Ind. vii. 43 (1896) et in Trimen, Fl. Ceyl. v. 144 (1900). *P. Myurum* Wight ex Steud. l.c. *P. stenostachyum* Thw. Enum. Pl. Zeyl. 436 (1864); Trimen, Cat. Pl. Ceyl. 105 (1885). *Aira interrupta* Rottl. ex Steud l.c.

KENYA COLONY: Mombasa, *Boivin*! INDIA: South Deccan Peninsula, *Wight* 1624! CEYLON: Jaffna, 8th Jan. 1796, *Herb. Rottler*! Trincomalee, *Glenie* (C.P. 3845)! Hambantota, near sea, *Alston* 1913!

This species, together with *Panicum nodosum* Kunth (now referred to *Hemigymnia*), forms a section "*Breviglumae*" in Hook. f. Fl. Brit. India. As one of us has pointed out in Prain, Fl. Trop. Africa, ix. 742, the circumstances that the glumes of both species are of about equal length and at the same time so short that the greater part of the back of the fertile floret is exposed, suggest indeed at the first glance affinity, but neither the habit nor the structure of the spikelet, except for the character alluded to, supports this view. The presence of a minute bristle was apparently overlooked by Hooker, and in fact in those specimens which he had for examination the bristle is very obscure; somewhat similar cases are met with in species of *Setaria*, such as *S. Thollonii* Stapf. The bristles of *H. transiens* are very fine and resemble those of *Pennisetum* rather than of *Setaria*.

XLIV.—PLANTS NEW TO ASSAM: I. G. H. Spare and C. E. C. Fischer.

Collections of plants from the less known parts of the Province of Assam in North East India having come to hand for determination, it is believed that it will be useful if such as are in themselves new or new to the locality are brought together. The area covered includes the civil Districts of Sylhet, Cachar, Goalpara, Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur, together with the Garo, Khasia, Jaintia, Naga, Manipur and Lushai Hill tracts and the Mishmi and Abor countries.

No general flora confined to Assam has been published, and for a knowledge of the plants found in the province recourse must be had to the Flora of British India and to sundry scattered papers, particularly in several issues of the Records of the Botanical Survey of India. The species to be included in this series, besides those described for the first time, are such as are not mentioned in any of the above quoted publications as having been found definitely in Assam.

Anemone polyanthes *Don* [Ranunculaceae].

Known from the Himalayas from Kashmir to Sikkim.

Mishmi, Delei Valley, 13,000-14,000 ft., June, *Kingdon Ward* 8334, "Flowers cream, tinged with green, probably owing to the cold. On steep brown-turf slopes facing South."

Thalictrum elegans *Wall.* [Ranunculaceae].

Known from the Himalayas from Hazara to Sikkim.

Mishmi, Delei Valley, 5000–6000 ft., July, *Kingdon Ward* 8433, "3–4 ft. high, growing in thickets and high herbaceous vegetation on the sunny side of the valley where the slope is very steep and rocky."

Ranunculus hyperboreus *Rottb.* var. **radicans** *Hook. f. & T.* [Ranunculaceae].

Known from the Himalayas from Kashmir to Sikkim and W. Tibet.

Mishmi, Delei Valley, 11,000–12,000 ft., June, *Kingdon Ward* 8354, " Flowers bright-yellow. On moss-clad rocks and cliffs in gullies : also on open grassy slopes in the forest area."

Ranunculus diffusus *DC.* [Ranunculaceae].

Known from the Himalayas from the Chenab to Bhutan ; the higher mountains of Peninsular India, Sumatra and Java.

Mishmi, Delei Valley, 5000–6000 ft., May, *Kingdon Ward* 8149, 8152, " Flowers golden-yellow. In stony pastures and in masses by streams in shade. Sends out long rooting runners and forms colonies " ; 8000–10,000 ft., June, *Kingdon Ward* 8303, " Amongst bush vegetation in steep gullies in the rain forest."

Caltha palustris *Linn.* [Ranunculaceae].

Widespread in all temperate regions ; Himalayas from Kashmir to Nepal.

Mishmi, Delei Valley, 12,000–13,000 ft., June, *Kingdon Ward* 8338, " Flowers bright-yellow. On steep muddy turf slopes with Southern aspect." Delei Valley, 13,000–12,000 ft., July, *Kingdon Ward* 8423, 8513, " Flowers golden-yellow. On alpine turf slopes."

var. **purpurea** *Spare & Fisch.*, var. nov., with magenta petals.

Kaso, Delei Valley, 12,000 ft., July, *Kingdon Ward* 8409, " On alpine meadow slopes amongst scrub " ; Delei Valley, 11,000–12,000 ft., Aug.-Sept., *Kingdon Ward* 8616, " In steep gullies, south slopes, amidst high herbage."

Trollius Farreri *Stapf* [Ranunculaceae].

Found in W. China by Farrer.

Mishmi, Delei Valley, 11,000 ft., June, *Kingdon Ward* 8315, " Flowers golden-yellow. On grassy slopes of gullies facing North."

Isopyrum adiantifolium *Hook. f. & T.* [Ranunculaceae].

Known from Sikkim.

Mishmi, Delei Valley, 7000–8000 ft., June, *Kingdon Ward* 8302, " Petals snow-white. Amongst bush herbage in steep gullies in the rain forest."

Paraquilegia grandiflorum *Drumm. & Hutch.* [Ranunculaceae].

Known from the Himalayas from Kumaon to Balti and in Siberia.

Mishmi, Delei Valley, 10,000–11,000 ft., May, *Kingdon Ward* 8249, " A dark-flowered form with deep-violet petals. Hanging in bunches from the granite cliffs in shade where there is perpetual dripping water."

Magnolia Campbellii *Hook. f. & T.* [Magnoliaceae].

Known from Sikkim and Bhutan.

Mishmi, Delei Valley, 8000–9000 ft., Sept.-Oct., *Kingdon Ward* 8629, 8723, "The trunk usually splitting into several branches almost from the ground, often hollowed out below as though supported on flying buttress roots. In bud only up to 25th Oct., fairly common scattered in the forest in the damper hollows where bamboos grow thickly. Damp clayey soil."

Magnolia globosa *Hook. f. & T.* [Magnoliaceae].
Known from Sikkim.
Mishmi, Delei Valley, 9000 ft., June, *Kingdon Ward* 8297, "In steep gullies and on the flanking ridges among trees."

Schizandra propinqua *Hook. f. & T.* [Magnoliaceae].
Known from the Himalayas from Nepal to Kumaon.
Mishmi, Delei Valley, 2000 ft., April, *Kingdon Ward* 8009, "Perianth segments pale-yellow, the innermost tinged with cherry-red at the base, staminal cone cherry-red. A big climber in the jungle."

Schizandra sphenanthera *Rehd. & Wils.* [Magnoliaceae].
Recorded from China.
Mishmi, Delei Valley, 8000–9000 ft., May, *Kingdon Ward* 8210, "Flowers deep cherry-red, fruit in short compact purple hanging spikes. A big rambling climber on the edge of the rain forest on the ridge."

Podophyllum versipelle *Hance* (Berberidaceae].
Known from China.
Mishmi, Delei Valley, 10,000 ft., flowering in May, *Kingdon Ward* 8265, "Flowers white. In the Rhododendron-conifer forest."

Mahonia calamicaulis *Spare & Fisch.*, sp. nov. [Berberidaceae]; *M. eurybracteatae* Fedde affinis, stipulis nullis, foliolis ovato-lanceolatis vel ellipticis apice caudato-acuminatis, spinulis marginis plurribus, bracteolis linearibus, sepalis 9, petalis apice bilobis, antheris quam filamenta valde brevioribus differt.

Undershrub 2–3 ft. high, quite glabrous. *Stem* terete, yellowish-brown, shining, marked with the scars of fallen leaves and resembling the stem of a *Calamus*, below bearing a few broadly triangular, acute scales 7–18 mm. long. *Leaves* imparipinnate, aggregated near the end of the stem; rhachis terete, deeply sulcate, base semi-amplexicaul, 15–30 cm. long, swollen and articulate at the insertion of the leaflets, exstipulate. *Leaflets* coriaceous, 4–7 opposite pairs, sessile, when dry brown above, paler and subglaucous below, usually enlarging upwards with the terminal largest, but sometimes middle ones largest and diminishing in both directions, sometimes with a pair of leaflets of the smallest size 5 mm. from the base of the rhachis, at others the lowest pair up to 10 or 12 cm. from the base and of medium size, lateral leaflets ovate-lanceolate, caudate-acuminate, base cuneate, inequilateral, 3–9·5 cm. long, 1·3–4 cm. wide, margins

slightly revolute, the lower third entire the rest repand spinulose-dentate except for the acumination which is entire, teeth 5–9 on each side, one side usually with 1 more than the other ; terminal leaflet elliptic, caudate-acuminate, apex spinulose acute or blunt and suddenly spinulose, base cuneate, equilateral 7·5–11·5 cm. long, 2·5–5·5 cm. wide, the midrib of all leaflets slightly impressed above, prominent below, primary nerves 5–7, ascending, not prominent. *Inflorescence* terminal, of several dense-flowered racemes, sometimes with a small branch near the base, 6–12 cm. long ; peduncle flattened, about 2 cm. long, arising from imbricating, rigid, triangular, acute scales up to 1·7 cm. long ; bracts at the forks and lower bracteoles lanceolate from a broad semi-amplexicaul base, 8–9 mm. long, upper bracteoles linear-lanceolate, acuminate, about 6 mm. long. *Flowers* solitary or twin, pedicels 4–5 mm. long. *Sepals* 9, broadly obovate, rounded, 4–5 mm. long, outermost smaller. *Petals* 6, narrowly obovate, 5 mm. long, 2-glandular at the base within, apex shortly 2-lobed, lobes obtuse. *Stamens* 6, 3·5 mm. long ; anthers about half the length of the stout filaments. *Ovary* ellipsoid, 3 mm. long ; ovules 4 ; stigma sessile, depressed capitate. *Fruit* not seen.

Assam, Delei Valley, 7000–8000 ft., April, *Kingdon Ward* 8058, " A dwarf, erect undershrub of the temperate rain forest, growing in shade under the trees along the ridges. Flowers bright-yellow, fragrant. Leaves very hard and leathery."

In the Herbarium at Kew there is a twig without flowers or fruit from Bhutan (collector unknown) which we consider to be identical with this species.

Meconopsis aculeata *Royle* [Papaveraceae].

Reported from the Himalayas from Kashmir to Kumaon.

Mishmi, at Kaso in the Delei Valley, 12,000–13,000 ft., July, *Kingdon Ward* 8420, " A single plant found on an earth slide facing South."

Meconopsis paniculata *Prain* [Papaveraceae].

Known from Nepal, Sikkim and Bhutan.

Mishmi, at Kaso in the Delei Valley, 13,000–14,000 ft., July, *Kingdon Ward* 8425, " Not common, scattered amongst alpine meadow plants or scrub on the South face of the ridge, where it is scarped into high cliffs."

Dactylicapnos scandens *Hutch.* [Fumariaceae].

Known from the Himalayas from Garhwal to Nepal.

Mishmi, Delei Valley, 8000–9000 ft., Sept., *Kingdon Ward* 8649, " Flowers almost orange, fruit red. Scrambling over bushes in open parts of the rain forest."

Loxostemon pulchellus *Hook. f. & T.* [Cruciferae].

Reported from Sikkim.

Mishmi, at Kaso in the Delei Valley, 12,000 ft., July, *Kingdon Ward* 8442, " Flowers purple. On earth slopes and rock outcrops."

Sisymbrium himalaicum *Hook. f. & T.* [Cruciferae].

Known from the Himalayas from Kashmir to Sikkim.

Mishmi, at Kaso in the Delei Valley, 12,000 ft., July, *Kingdon Ward* 8441, " Flowers mauve. On earth slopes and rock outcrops."

Viola biflora *Linn.* [Violaceae].

Known from Temperate Europe and Northern Asia ; Himalayas from Kashmir to Sikkim.

Mishmi, Delei Valley, 11,000–14,000 ft., June, *Kingdon Ward* 8332, 8360, " Along the rocky knife-edge ridge in turf and on grassy slopes under rocks or bamboos ; on earth slides in the open gullies."

var. **hirsuta** *Spare & Fisch.*, var. nov., much more hairy and with narrower spur.

Delei Valley, 11,000–12,000 ft., July-Aug., *Kingdon Ward* 8430, 8631, " On earth slopes and rock outcrops in gullies."

Viola Hookeri *T. Thoms.* [Violaceae].

Known from Bhutan and Sikkim.

The description in the Fl. Brit. India i. 183 of this species is meagre and to a certain extent misleading as it includes, as therein apprehended, 2 separate species. It is desirable therefore to publish the fuller description which follows :—

Herb, glabrous or nearly so. *Rootstock* usually elongate, slender or rather thick and warted ; stolons when present, slender, long or short. *Leaves* radical, orbicular-reniform to ovate-cordate, apex rounded rarely subacute, basal sinus deep, moderately wide or lobes touching or overlapping, 1·5–4 cm. long, 1·5–3·6 cm. wide, margins broadly and evenly crenate, the upper end of the crenatures deeply indented and usually with a small rounded point, base with 2 spreading primary nerves on either side and 2 or 3 pairs above, all arching and anastomosing, not prominent, both faces quite glabrous and dotted with minute glands ; petioles slender, not winged, up to 10 cm. long ; stipules gland-dotted, lanceolate, acuminate, toothed or lacerate, up to 1·3 cm. long, the apex and ends of the teeth or divisions glandular. *Peduncles* slender, 1-flowered, up to 7 cm. long, furnished a little distance below the flowers with 2 linear, gland-dotted bracts up to 5 mm. long, apex and a few linear basal teeth gland-tipped. *Flowers* up to 1 cm. long, white, the lower petal shorter and purplish or veined with purple. *Sepals* narrowly-lanceolate or linear ensiform, acute, gland-dotted and gland-tipped, 5 mm. long, nerves obscure, margins very narrowly scarious, with the petals very minutely puberulous (observable only under magnification). *Spur* saccate. *Ovary* gland-dotted ; style narrowed downwards from the obscurely beaked stigma. *Capsule* about 5 mm. long, valves apiculate, green, covered with reddish-brown (when dry) glands. *Seeds* not seen.

Bhutan, *Griffith* 233 ; Sikkim, Lachen 7000–10,000 ft., July-Aug., *J. D. Hooker* ; Laglep, 9000 ft., May, *C. B. Clarke* 27750A ; Yakla, 9000 ft., May, *C. B. Clarke* 27845 ; Tonglo, 9000 ft., June, *C. B.*

Clarke 35734; Assam, Delei Valley, Chibaon, 8000 ft., April, *Kingdon Ward* 8063, " In grassy dells, shaded by scattered trees "; 7000–8000 ft., June, *Kingdon Ward* 8301, " In clumps on moss-lined rocks and precipitous banks in the rain forest. Heavily shaded moist positions "; 9000–10,000 ft., Aug. (in fruit), *Kingdon Ward* 8563, " On forested slope in heavy shade. Grows in clumps when the leaf-mould is always damp."

Viola Hediniana *Becker* [Violaceae].
Collected previously in Yunnan.
Mishmi, Delei Valley, 10,000–11,000 ft., Aug., *Kingdon Ward* 8564, " Flowers bright yellow; stems erect. On earth slopes and gneiss cliffs and outcrops in the open gullies facing North."

Viola moupinensis *Franch.* [Violaceae].
Known from N. Burma and W. China.
Mishmi, Delei Valley, 12,000 ft., June, *Kingdon Ward* 8287, " Flowers pale-violet with darker lines. Scattered over steep North slope below the ridge under the shadow of Rhododendron bushes, but not in shade."

Viola pogonantha *W. W. Smith* [Violaceae].
Collected previously in Yunnan.
Mishmi, Delei Valley, 6000 ft., April, *Kingdon Ward* 8136, " Flowers mauve or pale-violet. On shady banks, often by streams."

Polygala Mariesii *Hemsl.* [Polygalaceae].
Previously found in W. China.
Mishmi, Delei Valley, 2000 ft., April, *Kingdon Ward* 8015, " A rounded bush 5 ft. high. Flowers opening yellow turning purple. Amongst rocks and boulders on the river bank or in the bed just above flood-level."

Lychnis multicaulis *Wall.* [Caryophyllaceae].
Known from the Himalayas in Nepal, Kumaon and Sikkim.
Mishmi, Delei Valley, 7000–8000 ft., Sept., *Kingdon Ward* 8653, " On open South slopes among grass, bracken, *Epilobium*, etc."

Lychnis nigrescens *Edgew.* [Caryophyllaceae].
Known from Sikkim.
Mishmi, Delei Valley, 11,000 ft., Oct., *Kingdon Ward* 8714, " Flowers cream streaked with pink. In nooks on the cliffs."

Hypericum oblongifolium *Chois.* [Hypericaceae].
Himalayas in Kumaon.
Mishmi, Delei Valley, 11,000–12,000 ft., Aug., *Kingdon Ward* 8617, " An undershrub with large golden-yellow flowers. On rocky outcrops facing South, amongst bamboos."

Sarauja subspinosa *Anth.* [Theaceae].
Collected previously in China.

Mishmi, Delei Valley, 4000 ft., July, *Kingdon Ward* 8485, " A tall ungainly shrub, hardly 20 ft. high, in secondary thickets. Flowers pale-pink in large bunches all up the old wood."

Argostemma fragile *Geddes* [Rubiaceae].
Obtained only in Siam.
Southern Lushai Hills, 2000–4000 ft., June-Aug., *Rev. W. J. L. Wenger* 221A, " On wet rocks."

Dichrocephala minutiflora *Van.* [Compositae].
Known from Yunnan.
Lushai Hills, Koladyne River, 2000 ft., Jan., *Mrs. N. E. Parry* 583, " Flowers bright-mauve. Plant strongly aromatic."

Leucomeris decora *Kurz* [Compositae].
Previously recorded from Burma and China.
Manipur, 3500 ft., April, *G. Watt* 6261, " In woods above Lareen " ; Lushai Hills, Chakang in the Lakher country, 5000 ft., flowers in Feb., *Mrs. N. E. Parry* 122, " Medium-sized tree ; flowers fragrant." There are also specimens in the Herbarium at Kew from Siam.

Rhododendron Veitchianum *Hook.* [Ericaceae].
Collected in S. Burma.
Lushai Hills, Pongpui, 6000 ft., flowers Feb., *Mrs. N. E. Parry* 1, 146. No. 1 was epiphytic, No. 146 a terrestrial large shrub.

Didymocarpus adenocarpa *C. E. C. Fischer*, sp. nov. [Gesneraceae] : *D. purpureo-bracteatae* W. W. Smith peraffinis, foliis leviter cordatis subtus sparse pubescentibus atque glandulosis, bracteis connatis, floribus cum dentibus calycinis brevioribus atque numerosioribus, staminodiis 2–3, disco apice lobato, ovario fructuque glanduloso differt.

A low *herb* ; stem 10 cm. or more long, brown, sparsely brown pubescent upwards with multicellular hairs. *Leaves* all caulescent, membranous, 2–3 pairs, pairs often unequal, oblong, acute or abruptly acutely cuspidate, base shallowly cordate, 9–15 cm. long, 5–8 cm. wide, yellowish above, pale below, sparsely pubescent on both faces and ciliate with white multicellular hairs, rather densely dotted below with minute globose, pale-brown, glistening glands, primary nerves 8–10 pairs, margins coarsely crenate-dentate ; petioles 1·5–3 cm. long, brown-pubescent with multicellular hairs. *Inflorescence* of axillary cymes ; peduncles slender, 3–4 cm. long, sparsely brown-pubescent below, glabrous upwards, trichotomously branched ; branches 0·75–2 cm. long, the central 1-flowered, the lateral again trichotomously branched ; bracts at the forks 2, suborbicular, obtuse, connate to half-way or less, 5–7 mm. long, reddish-brown, glabrous ; pedicels slender, glabrous, 5 mm. long. *Flowers* up to about 20 in the cyme, glabrous. *Calyx* narrowly funnel-shaped, reddish-brown, 0·8–1 cm. long, with 5–9, short, blunt, broadly triangular teeth with a vein running into each. *Corolla*

3 cm. long, tube cylindric, slightly widened to the mouth, white tinged with pink, 2-lipped, lobes semi-circular, the 3 lower rather larger than the 2 upper, deep pink. *Stamens* 2, inserted $\frac{1}{3}$ of the length of the tube from the mouth of the corolla ; anthers in the mouth, coherent. *Staminodes* 2 or 3, inserted lower than the stamens, 2 upper nearly as long as the stamens, filiform, bifurcate near the apex, the third when present below the others and much shorter, simple. *Disc* cylindric, 2 mm. long, mouth lobed. *Ovary* linear, slightly widened upwards, covered with globose yellow glands ; style comparatively stout ; stigma large, peltate, pubescent above. *Capsule* linear, brown, 3–3·5 cm. long including the slender stipe and persistent style, valves dotted with glistening yellowish glands. *Seeds* very minute, pale-reddish-brown, fusiform, acute at both ends.

Assam, Southern Lushai Hills, 4500 ft., Sept., *W. J. L. Wenger* 239, " In shady forests."

XLV.—NEW SPECIES FROM THE MALAY PENINSULA AND BORNEO. H. N. Ridley.

Millettia cuspidata *Ridley* (Leguminosae) ; affinis *M. sericeae* Benth., foliis subtus haud fulgentibus, oblongis cuspidatis, calyce breviore latiore, carina et vexilli dorso aureo-hirtis differt.

Herba scandens glabra. *Folia* 18–20 cm. longa ; foliolis oppositis 6, tenuiter coriaceis glabris oblongis longe cuspidatis basibus obtusis, nervis 5-paribus inarcuantibus subtus elevatis nervulis reticulationibusque conspicuis, 8·5 cm. longis 3 cm. latis (cuspide 1·7 cm. longo). *Panicula* axillaris 20 cm. longa laxa ramis dissitis 8-12 cm. longis pubescentibus. *Flores* copiosi pallide rosei, pedicellis 1 mm. longis, calyce campanulato dense hirto 3 mm. longo, dentibus brevissimis, vexillo orbiculari unguiculato extra aureo-sericeo intus glabro roseo, carina subaequilonga dense aureo-sericea, alis oblongis unguiculatis glabris, ovario oblongo pubescente.

Borneo : Sarawak, in Matang Woods, Jan. 1915, *Ridley*. " Flowers pinkish."

This species is allied to *M. sericea* Benth., but differs in the oblong long-cuspidate leaflets not fulgent beneath ; the calyx is shorter and broader ; the carina is covered with golden silky hairs, as is the back of the vexillum.

Spatholobus strigillifer *Ridley* (Leguminosae) ; *S. roseo* Prain approximat, sed undique glaber, foliolis coriaceis ovatis magnis, legumine sublignoso magno cultriformi.

Frutex scandens. *Folia* trifoliolata foliolis oblongis vel ovatis acutis basibus rotundatis, glabris coriaceis, nervis subtus elevatis 6–paribus, 9–14 cm. longis 4·5–10 cm. latis, petiolulis 8 mm. longis, rhachide producta 3 cm. longa, stipellis linearibus acuminatis 2 mm. longis, petiolis 6 cm. longis. *Panicula* 30 cm. longa patens, adulta glabra, ramis 11 cm. longis dissitis; *floribus* albis, pedicellis gracillimis 4 mm. longis ; *calycis* tubo urceolari lobo supremo lato brevissime

bilobo, ceteris brevissimis ovatis; *corolla* 5 mm. longa, vexillo 5 mm. lato rotundato striato, carina breviore obtusa; *stamine* vexillari libero, ceteris filamentis gracilibus basi connatis; *ovario* cylindrico ovulis 2, stylo gracili, stigmate minuto. *Legumen* falcatum crassum lignosum reticulatum, margine incrassato, apice rotundato, 12 cm. longum, 3 cm. latum.

Borneo: Sarawak, Kuching, *Haviland* 1974, and Rejang Sibu, *Haviland* 2897; Matang, Jan. 1915, *Ridley* (type); *Beccari* 2990.

This species is perhaps as near *S. roseus* Prain as any. It is remarkable for its large coriaceous ovate leaflets which in young branches are smaller and oblong, and for its very stiff almost woody falcate fruits which are just the shape of a boomerang.

Dialium angustisepalum *Ridley* (Leguminosae); affine *D. patenti* Bak. sed sepalis anguste lanceolatis acuminatis differt.

Arbor. Folia 5-foliolata, foliolis ellipticis cuspidatis basibus rotundatis vel breviter cuneatis, coriaceis glabris, nervis vix conspicuis 10-paribus, 6–7 cm. longis 3–4·5 cm. latis, petiolulis crassis 5 mm. longis. *Panicula* laxa 10–20 cm. longa, ramis patentibus puberulis; *sepalis* lanceolatis acuminatis 4 mm. longis puberulis; *petalis* nullis; *ovario* cylindrico conico pubescente 2 mm. longo, stylo aequilongo.

Malay Peninsula: Pahang, Kuantan, Gunong Lesang, Native Coll. *Yusop* 4123 (type): Bukit Buserah, *F. G. Yeop* 846. Nat. Name "Kranji Burong."

This species is undoubtedly closely allied to *D. patens* Baker, for which I mistook it, but is very distinct in the narrow lanceolate sepals, narrowing upwards from a broader base.

Dialium Havilandii *Ridley* (Leguminosae); affine *D. platysepalo* var. *ambiguo* Bak. sed foliolis 9–15, sepalis latioribus ovatis, ovario velutino, drupa subpyriformi.

Arbor. Folia 15 cm. longa, foliolis 9–15 coriaceis oblongis cuspidatis basi obtusis superne glabris subtus pallidioribus puberulis, nervis 10-paribus inarcuantibus vix prominulis, nervulis plurimis cum reticulationibus papillatis, 5–7·5 cm. longis, 2–2·5 cm. latis, petiolulis 4 mm. longis transverse rugosis. *Panicula* valida 18 cm. longa, ramis 11 cm. longis hirtis; *bracteis* 1 mm. longis ovatis; *pedicellis* crassis aureo-pubescentibus 4 mm. longis, alabastris ovoideis aureo-pubescentibus; *sepalis* ovatis undique pubescentibus 5 mm. longis; *staminibus* 2, antheris lineari-oblongis 3 mm. longis; *ovario* oblongo velutino brevi, stylo velutino. *Drupa* ovato-pyriformis atrobrunnea pubescens 3 cm. longa 1·5 cm. lata.

Borneo: Sarawak, *Beccari* 2517, 2949; Kuching, Feb. and Sept. 1892, *Haviland* 1700 (type), 2283. "Calyx brown velvety, anthers yellow, filaments white."

This species is allied to *D. platysepalum* Baker but the sepals are much broader and ovate, the ovary hairy and the leaflets more numerous. All of this set of *Dialium* are closely allied.

Bauhinia cancellata *Ridley* (Leguminosae) ; *B. foraminiferae* Gagnep. approximata sed foliis multo majoribus integris vel breviter bifidis subtus hirtis, floribus minoribus purpureis, petalis oblongis ad basin angustatis, marginibus crispatulis nec spathulatis, disco hirto, stamine fertili 1, stylo breviore crasso distincta.

Frutex scandens. *Rami* flexuosi angulati. *Folia* coriacea minute cancellato-reticulata ovata integra vel breviter biloba obtusa superne glabra, subtus nervis elevatis 6–7-paribus rufo-hirtis, 5–6 cm. longa, 4–5 cm. lata, petiolis gracilibus rufo-hirtis 3 cm. longis. *Flores* purpurei breviter racemosi ; pedicellis gracilibus 3 cm. longis ; *calycis* tubo brevi obconico 2 mm. longo, sepalis 3 coriaceis ovatis obtusis glabris 3 mm. longis, *petalis* oblanceolato-oblongis obtusis marginibus crispatulis basibus angustatis, dorso parce rufo-hirtis, 5 mm. longis 1·5 mm. latis ; *stamine fertili* glabro filamento basi incrassato superne attenuato, anthera globosa, *sterilibus* 3 ; *ovario* fusiformi stipite aequilongo, stylo crasso brevi, stigmate magno bilobo, disco rufo-hirto.

Malay Peninsula : Negri Sembilan, Gunong Angsi, west side, 2600 ft. alt., Nov. 20, 1923, *Mohamed Nur* 11559.

This species is most nearly allied to *B. foraminifera* Gagnepain, of Sarawak, Borneo, but it differs in the larger leaves more shortly bilobed, usually for not more than one third of their length, and often quite entire and more coriaceous. The flowers are much smaller with narrow oblong purple crisped petals, not spathulate and broad as in *B. foraminifera* ; and on the disc at the base of the ovary is a tuft of red hairs, absent in all the allied species.

Bauhinia rosulenta *Ridley* (Leguminosae) ; affinis *B. cardiophyllae* Merrill, sed foliis majoribus, plurivenosis, subtus hirtis, inflorescentia hirtula petalis oblongo-oblanceolatis, ovarii stipite et dorso rufo hirtis.

Frutex scandens. *Folia* coriacea subtus glaucescentia, ovato-cordata integra basibus paullo emarginatis superne glabra subtus parce rufo-hirta, nervis 11 rufo-hirtis, 6 cm. longa 7 cm. lata, petiolis 3 cm. longis rufo-hirtis. *Racemi* multiflori 5 cm. longi, rufo-hirti, *pedicellis* gracilibus hirtis 4 cm. longis ; *alabastris* globosis ; *calycis* tubo 3 mm. longo cylindrico, lobis lanceolatis 3 mm. longis ; *petalis* oblongis oblanceolatis basi attenuatis marginibus cristatis, 1 cm. longis 2 mm. latis, rosulentis ; *staminibus* 8, quorum 6 infertilibus, 2 antheriferis, antheris subglobosis ; *ovario* fusiformi stipite et dorso dense longe rufo-hirsuto, *stylo* aequilongo glabro, stigmate subgloboso magno.

Borneo : Sarawak, near Kuching, *Haviland* 927. " Petals pinkish, base of filaments red."

Allied to *B. cardiophylla* Merrill, but the leaves are not distinctly cordate and are larger, the nerves more numerous and like the back of the leaf red-hairy ; the inflorescence is also hairy, the petals narrower, oblanceolate ; the stalk of the ovary is covered with long red hair continued part way along the back of the ovary.

Leucostegane grandis *Ridley* (Leguminosae); differt a *L. latistipulata* Prain foliis majoribus bijugis, sine stipulis latis, floribus multo majoribus roseis legumine magno.

Arbor. Folia bijuga, foliolis 4 oppositis glabris coriaceis oblongis vel ellipticis acute abrupte acuminatis basibus paulisper inaequilateralibus nervis inconspicuis circiter 12-paribus, secundariis subaeque conspicuis, gracillimis, 6–15 cm. longis 3–6 cm. latis, petiolis 5 mm.–1 cm. longis. *Racemi* vel *paniculae* cauliflori congesti 4–5 cm. longi puberuli, *bracteis* ovatis acuminatis ciliatis 2 mm. longis; *floribus* dissitis roseis, pedicellis 1 cm. longis; *sepalis* 5, obovatis obtusis carnosis marginibus ciliatis, 1·2 cm. longis 4 mm. latis; *petalis* minimis ovatis acutis pubescentibus hirtulis carnosis; *staminum* filamentis ad bases dilatatis quasi alatis superne angustatis, antheris oblongis; *ovario* cylindrico hirto, *stylo* glabro aequilongo, stigmate minuto. *Legumen* ensiforme curvatum apicem versus dilatatum, 26 cm. longum 5 cm. latum, seminibus complanatis 5.

Borneo: Kuching in Sarawak, *Haviland* 1799.

The genus *Leucostegane* Prain is based on a single species found by me in the Dindings, Malay Peninsula. The new species differs from that in the much greater size of all parts, leaves, flowers, pod and seeds; there are only two pairs of leaflets to the leaf, instead of 6, and the large stipules are wanting.

Crudia Beccarii *Ridley* (Leguminosae); affinis *C. bantamensi* Koorders sed foliis acuminatis, floribus longius pedicellatis differt.

Arbor. Folia 4-foliolata, glabra, foliolis oblongo-oblanceolatis cuspidatis basibus obtusis coriaceis subtus glaucescentibus nervis 6-paribus inarcuantibus, 10–14 cm. longis 5 cm. latis, petiolulis 5 mm. longis crassis. *Racemus* 13 cm. longus, floribus dissitis, *bracteis* minutis ovatis acutis hirtis, *pedicellis* 3 mm. longis; *sepalis* obovatis 3 mm. longis in alabastro puberulis, tubo calycis brevi obconico; *staminibus* 10 filamentis 5 mm. longis antheris ovoideis; *ovario* oblongo-ovoideo dense hirto 3 mm. longo, *stylo* glabro 6 mm. longo.

Borneo: Sarawak, *Beccari* 3903.

This species, allied to *C. bantamensis* Koorders, of Java, differs in having acuminate leaves and longer pedicels to the flower.

Crudia velutina *Ridley* (Leguminosae); affinis *C. Evansi* Ridl. sed multo magis velutina, pedicellis longioribus sepalis angustioribus lineari-lanceolatis staminibus brevibus.

Arbor. Rami albescentes. *Folia* 2–4-foliolata, folia juniora undique velutina, foliolis coriaceis superne glabris subtus velutinis, ellipticis obtuse acuminatis, basibus obtusis nervis 18-paribus, 10–18 cm. longis 5–8 cm. latis, petiolis crassiusculis 1 cm. longis. *Racemi* 10–11 cm. longi axillares, *bracteis* minutis ovatis acuminatis dense pubescentibus, *pedicellis* crassiusculis velutinis 2 mm. longis; *alabastris* oblanceolatis; *sepalis* lineari-lanceolatis crassis extra hirtis 3 mm. longis; *staminibus* 10, filamentis glabris, antheris oblongis

sepalis brevioribus ; *ovario* 4 mm. longo dense hirto oblongo-conico, *stylo* 4 mm. longo glabro.

Borneo : Sarawak, Bintulu, April 1893, *Haviland* 3071.

Allied to *C. Evansi* Ridley, of Pahang, but the whole plant much more velvety, the pedicels longer, the sepals narrower and linear-lanceolate ; the stamens appear to be unusually short.

Begonia Yappii *Ridley* (Begoniaceae) ; affinis *B. Forbesii* King sed planta major petalis nullis differt.

Herba. Rhizoma repens crassiusculum. *Folia* ovata breviter acuminata basi rotundata subaequaliter breviter biloba, marginibus cum nervis tenuibus 6–8, subtus rufo-hirta, 5·5–6 cm. longa, 3·5–5·5 cm. lata, petiolis 2–9 cm. longis hirtis. *Panicula* gracilis 11 cm. longa glabra, ramis 2–3 paucifloris 2–3 cm. longis. *Flores* parvi albi : *masculi* sepalis 2 rotundatis 5 mm. latis, petalis nullis, androecii globosi stipite conico, antheris brevibus oblongis ; *feminei* sepalis iis masculi similibus, stylo triramoso. *Capsula* triptera alis aequalibus oblongo-lanceolatis acuminatis obtusis, 5 mm. longis.

Malay Peninsula : Kelantan, Kwala Aring, *Yapp* 25.

Allied to *B. Forbesii* King, but that species has 2 petals, which appear to be totally missing from this plant.

Ophiorrhiza longe-repens *Ridley* (Rubiaceae) ; *O. fontinali* Ridl. approximata sed caulibus elongatis sublignosis repentibus adscendentibus, foliis parvis subcoriaceis, floribus paucis, lobis corollae lanceolatis valde distincta.

Suffrutex repens elongatus. *Caulis* gracilis fragilis 26 cm. longus superne puberulus. *Folia* subcoriacea ovata obtusa basi rotundata vel cuneata, marginibus saepe ciliatis, ceterum glabris, nervis 5-paribus inarcuantibus, 1·5–2 cm. longa ; petiolis gracilibus 5 mm. longis. *Cymi* axillares pubescentes pauciflori, pedunculis 2 cm. longis gracilibus, pedicellis 2 mm. longis ; *calyce* campanulato lobis brevissimis lineari-lanceolatis ; *corolla* 7 mm. longa alba, tubo gracili 5 mm. longo, lobis lanceolatis acutis 2 mm. longis ; *staminibus* inclusis. *Capsula* obtriangularis vix retusa, 2 mm. longa, 7 mm. lata, glabra.

Malay Peninsula : Kelantan, Gua Panjang at Gua Ninik, in moss on limestone, *M. R. Henderson* 19524. " Flowers white."

This species is not clearly related to any known to me, but in some respects resembles *O. fontinalis* Ridley. Its wiry brittle stems creep in the moss on the limestone rocks and ascend. The small leaves are rigid, smooth, slightly paler beneath, usually glabrous, but some have short stiff hairs on the edge ; the upper part of the stem is pubescent ; the flowers are elongate cylindric but small, with short lanceolate lobes. The fruit is much like that of *O. fontinalis*, the upper edge being nearly straight.

Didymocarpus calcareus *Ridley* (Gesneriaceae) ; affinis *D. castaneaefolio* Ridl., foliis longioribus angustioribus oblanceolatis hirtis, bracteis latioribus lanceolatis acuminatis dentatis distincta.

Suffrutex. Caulis lignosus. *Folia* terminalia lanceolata subpatentia acuta, basi angustata marginibus dentatis, superne glabra ciliis paucis albescentibus in costa exceptis, subtus nervis elevatis 17–18-paribus cum costa parce albo-ciliatis, 10 cm. longa 4·5 cm. lata ; petiolis 2 cm. longis. *Pedunculus* gracilis hirtus 10 cm. longus, *bracteis* 2-paribus dissitis lanceolatis acuminatis marginibus dentatis 1 cm. longis. *Sepala* lineari-lanceolata ; *corollae* tubo 2 cm. longo lobis late rotundatis 1 cm. longis.

Malay Peninsula : Kelantan, Gunong Sitong, 1500 ft. alt. on limestone, *Mohamed Nur and Dr. Foxworthy* 12192. " Flowers pale blue."

This belongs to the set of *Didymocarpi* represented by *D. venustus* Ridley and *D. castaneaefolius* Ridley in which the stem is woody and leafy at the top and the peduncles bear a pair or two pairs of foliaceous bracts, one of which is in the middle of the peduncle. In this species, the lower pair, which is the larger, had distinct dentation of the margin resembling that of the leaves.

Codonoboea caelestis *Ridley* (Gesneriaceae) ; affinis *C. leucocodoni* Ridl. sed foliis multo majoribus hirtis herbaceis, nervis pluribus, floribus minoribus solitariis caeruleis, distincta.

Suffrutex. Caulis crassus lignosus 24 cm. longus superne densissime pilosus, pilis argenteis tectus. *Folia* oblanceolata basin versus gradatim attenuata subsessilia apice acuminata integra superne glabra subtus in marginibus, costa, nervisque 25-paribus albo-pilosa, 18 cm. longa 3 cm. lata. *Pedunculi* graciles basi albo-pilosi superne glabri 5 cm. longi uniflori, *bracteis* 2 lanceolatis obtusis glabris 3 mm. longis ; *sepalis* ad basin liberis 3 mm. longis lineari-lanceolatis ; *corolla* campanulata pallide caerulea 1·5 cm. longa, lobis brevibus oblongo-lanceolatis puberulis 5 mm. longis ; *staminibus* 2 brevibus antheris subglobosis ; *pistillo* glabro stigmate bilobo. *Capsula* cylindrica acuminata glabra 3 cm. longa.

Malay Peninsula : Kelantan, Sungei Keteh at Gua Ninik, *Henderson* 19683 (type). " Flowers pale blue." Sungei Keteh, plentiful along the riverside, *Mohamed Nur and Foxworthy* 11964.

This genus hitherto contained three species all from the region of Gunong Tahan in Pahang, at no great distance from Kelantan. This species has much smaller blue flowers than *C. leucocodon* and is very hairy. It curiously resembles the Borneo plant *Stilpnothrix* (*Didissandra*) in habit and general appearance, but the latter has four stamens. It has nothing to do with *Didissandra*, to which Clarke referred it, but is more allied to the *Boea* section of *Cyrtandraceae*.

Boea brachycarpa *Ridley* (Gesneriaceae) ; affinis *B. Kerrii* Craib, differt capsulis brevioribus crassiusculis stylo longo terminatis.

Suffrutex. Caulis elatus ultra 18 cm. altus ferrugineo-lanuginosus, internodiis 6 cm. longis. *Folia* opposita oblanceolato-obovata obtusa, basi attenuata, superne glabra subtus ferrugineo-

lanuginosa. *Paniculae* 3 lanuginosae laxae 30 cm. longae basi ramosae superne cymis oppositis remotis internodiis 4 cm. longis; *floribus* non visis. *Capsulae* 6 mm. longae cylindricae acuminatae subulatae dehiscentes tortae, in pedicellis 4 mm. longis filiformibus; *sepalis* linearibus basi dilatatis 2 mm. longis.

Malay Peninsula: Kelantan, Gua Ninik, *M. R. Henderson* 19668.

This species is allied to *B. Kerrii* Craib, of Siam, but differs in the very short and thick capsules with only one twist in dehiscence and terminated by a rather long persistent slender style. Except the very different *B. minutiflora* Ridley this has the shortest capsules of any species known to me.

Geunsia anomala *Ridley* (Verbenaceae); nulli speciei affinis; foliis magnis hirtis, floribus in spicis densis cauliforis, corolla brevi 4-loba, ovulis 2 pro loculo, distincta.

Frutex dense rufo-barbatus. *Folia* opposita chartacea obovata cuspidata basi acuta marginibus undulatis spinuloso-denticulatis, superne scabrido-hirta, subtus stellato-pilosa, nervis 8-paribus, 15–17 cm. longa 7·5–8 cm. lata, cuspide 1 cm. longo, petiolis crassis 1·5 cm. longis dense rufo-barbatis. *Flores* in capitulis densis hirtis, *pedunculis* lignosis demum glabris, 2–7 cm. longis infra folia ortis, *bracteis* lanceolatis hirtis; *calyce* tubuloso dentibus 4 margine hirtis, 5 mm. longis; *corolla* paullo longiore, glandulosa, lobis 4 oblongo-ovatis; *staminibus* 4, antheris oblongis apice bifidis, filamentis brevibus, stylo elongato; *ovario* 4-loculari, ovulis in quoque loculo 2 erectis.

Sarawak: *Beccari* 2759; Penkulu Ampat, young jungle, *Haviland* 760 (type).

This plant in its compact cauliflorous heads of flowers is unlike anything else, but it is suggested by Stapf, who has made many notes and drawings of structure on the specimens in the Kew Herbarium, that this is Briquet's *Geunsia Beccariana* in Engl. & Prantl, Pflanzenfam. iv. 3a, 165. It is possible that this was the plant he referred to, but as there is nothing more than the name, it is not worth perpetuating. Merrill quotes the above number of Beccari's as *Callicarpa Havilandi*, which it is not. This plant has the given characteristics of *Geunsia* to some extent, as defined by H. J. Lam, but there do not seem to me to be any characters sufficiently valid to separate the two genera; as this species, however, appears to have two ovules in each cell of the ovary it had better remain in *Geunsia*.

Callicarpa barbata *Ridley* (Verbenaceae); *C. basilanensi* Merrill approximat, sed foliis magnis barbatis, floribus in paniculis robustis longe pedicellatis glabris corolla 5-loba staminibus 5 distincta.

Frutex? hirsutissimus. *Folia* opposita chartacea magna obovata acuta basi longe attenuata, laminis ad bases petiolorum decurrentibus marginibus undulatis denticulatis, nervis 10-paribus, reticulationibus

subtus elevatis, superne pilis rufescentibus parce tectis, costis utroque latere rufo-barbatis, marginibus et nervis pilis plumosis rufo-hirsutis, 31 cm. longa 16 cm. lata. *Paniculae* in caulibus sub folia delapsa pilis stellatis et pubescentia tectae pedunculis ramisque 4-angulatis, 9 cm. longae 8 cm. latae, multiflorae, pedicellis 2 cm. longis gracilibus, *bracteis* lanceolatis 2 mm. longis; *calyce* cupuliformi, 3 mm. longo glabro, dentibus 5 obscuris; *corolla* glabra 5 mm. longa, lobis oblongis obtusis 5; *staminum* antheris oblongis 4 mm. longis, extra glandulosis, filamentis brevissimis; *stylo* aequilongo stigmate capitato. *Bacca* globosa 5 mm. crassa 4-locularis, semine in loculo solitario; calyce patelliformi 7 mm. lato.

SARAWAK: Rejang Kapit, March 1893, *Haviland* 3043.

The flowers are all in bud; probably the filaments lengthen as does the style when in flower. A very distinct plant with large hairy leaves, the stem bearded. The hairs are not simple, but possess numerous lateral branches, making them plumose.

Premna pallescens *Ridley* (Verbenaceae); *P. perakensem* King simulat sed foliis subtus albescentibus, calyce subintegro, corolla brevi, staminibus brevibus, differt.

Frutex? *Rami* albescentes. *Folia* coriacea glabra superne laevia brunnescentia (in sicco), subtus alba, oblongo-oblanceolata cuspidata basi obtusa, nervis 5-paribus superne cum costa depressis subtus elevatis, reticulationibus subtus elevatis conspicuis, 12–13 cm. longa 4 cm. lata. *Corymbus* terminalis, pedunculo 1–1·5 cm. longo, ramis paucis 2 cm. longis puberulis, *bracteis* oblongis obtusis 2 mm. longis infra ramos, *bracteolis* ovatis minutis; *floribus* brevissime pedicellatis; *calyce* cupulato ferme integro puberulo, lobis 4 rotundatis; *corolla* cylindrica ferme 2 mm. longa, lobis 4 ovatis brevibus; *staminibus* breviter exsertis, antheris reniformi-globosis; *ovario* 4-loculari, stylo brevi, ovulis in quoque loculo solitariis.

BORNEO: Kuching, Sarawak, *Haviland* 3052.

In foliage this resembles *P. perakensis* King but the calyx is nearly entire and the stamens much shorter. The white underside of the stiff leaves is very characteristic.

Vitex flava *Ridley* (Verbenaceae); affinis *V. longisepalae* King sed subglabra, paniculis minoribus laxis patentibus paucifloris glabris, bracteis minoribus, sepalis minoribus.

Arbor parva. *Folia* trifoliolata herbacea petiolis 7–8 cm. longis pubescentibus dein glabris, foliolis ovatis acuminatis basi cuneatis nervis 8-paribus, 10–15 cm. longis 4–10 cm. latis, superne glabris glandulosis costa nervisque brunneo-pubescentibus exceptis, subtus glanduloso-punctatis nervis decidue pubescentibus; petiolulis lateralibus 5 mm. longis terminali 3 cm. longo. *Paniculae* axillares pedunculis 2 cm. longis ramis patentibus aequilongis decidue puberulis, *bracteis* oblongis spathulatis obtusis 5 mm. longis; *alabastris* dense velutino-pubescentibus. *Flores* flavi pedunculis 2 mm. longis; *calyce* campanulato tubo 2 mm. longo lobis oblongis obtusis

3 mm. longis glanduloso-punctatis; *corolla* glandulis flavis tecta. *Drupa* globosa polita 5 mm. diametro, calyce accrescente.

Borneo: Sarawak, path to Tegora, Dec. 20, 1892, *Haviland* 2025. "Small tree, corolla yellow."

This is most nearly allied to *V. longisepala* King, of the Malay Peninsula, but that is densely hairy all over, whereas this plant is almost completely glabrous with merely a little deciduous pubescence, the bracts are much smaller and the sepals and corolla are covered with yellow glands as is the ovary and the leaves on both sides.

Vitex Havilandii *Ridley* (Verbenaceae); affinis *V. tetragonae* H. Hallier, ramis haud tetragonis, foliis minoribus coriaceis basibus obtusis, corolla multo minore differt.

Arbor parva. *Ramuli* puberuli. *Folia* coriacea unifoliolata, foliolo lanceolato cuspidato (cuspide 1–1·5 cm. longa) basi obtuso 8–11 cm. longo 3–5 cm. lato, nervis 9-paribus inarcuantibus 2 mm. a margine, subtus elevatis, reticulationibus conspicuis, costa in utroque latere elevata, petiolis 1·5-2 cm. longis apicibus incrassatis. *Paniculae* laxae pauciflorae in axillis superioribus 5–8 cm. longae puberulae ramis 1–3 cm. longis. *Flores* parvi 2–3 in ramulis brevibus, pedicellis 1 mm. longis, *bracteis* linearibus acuminatis 1 mm. longis; *calyce* cupuliformi 2 mm. longo dentibus 5 acutis usque subacutis brevissimis; *corolla* 6 mm. longa, basi glabra superne pubescente, lobis 4 oblongis obtusis, labello rotundato integro; *ovario* in calyce immerso globoso.

Sarawak: Sadong, Coalmine Hill, *Haviland* 861.

Species allied to *V. tetragona* H. Hallier which I know only from the description, but the leaves are smaller, not acute at the base nor chartaceous; the calyx is not pubescent and the corolla much smaller.

Saurauia Fraseri *Ridley* (Actinidiaceae); affinis *S. Ridleyi* Merrill, foliis etiam junioribus glabris floribus glabris sepalis petalisque ovatis latioribus.

Arbor? *Rami* nigro-brunnei, trichomatibus lanceolatis acuminatis parcis. *Folia* glabra oblanceolata acuta, basi attenuata marginibus remote denticulatis, nervis 14-paribus arcuantibus subtus elevatis, nervulis transverse parallelis, costa subtus elevata trichomatibus perpaucis, 28 cm. longa 10 cm. lata, petiolis 1·5–3 cm. longis, trichomatibus in junioribus multis, deciduis. *Racemi* trichomatibus tecti axillare, 2 cm. longi. *Flores* parvi glabri, sepalis 4 mm. longis ovatis obtusis, petalis oblongis obtusis 1 cm. longis, stylis 3, filiformibus, ovario hirto.

British N. Borneo: Banggi, 500 ft., March 1885, *M. Fraser* 233.

This is undoubtedly allied to *S. Ridleyi* Merrill, but the whole plant is much more glabrous, having only stiff flat hornshaped trichomes on stem and racemes, and very few on the midrib of the leaves.

XLVI.—NOTES ON AFRICAN GRASSES: X.*

O. Stapf & C. E. Hubbard.

A New Genus from Tanganyika Territory.

Heterocarpha *Stapf et Hubbard*, gen. nov.; affinis *Eragrosti* P. Beauv., sed differt spiculis secundum rhachin racemorum secundorum spiciformium dispositis, glumis heteromorphis, gluma inferiore spicularum terminalium coriacea 5–6-nervia, lateralium membranacea 1–3-nervia uno latere auriculata auriculo rotundato, gluma superiore spicularum omnium coriacea 6–8-nervia, lemmatibus breviter mucronatis ad nervos infra medium pilosis.

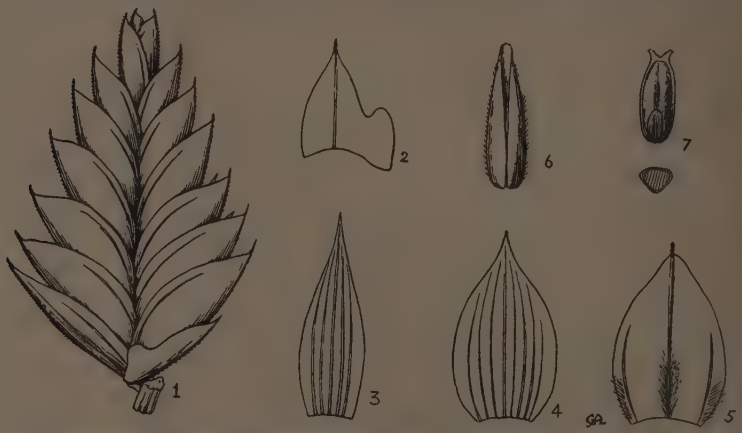
Spiculae ambitu oblongae, lanceolato-oblongae vel ovato-oblongae, lateraliter valde compressae, alternatim biseriatae atque dense imbricatae, secundae, subsessiles in rhachi triquetra racemorum spiciformium; rhachilla supra glumas articulata (?) et inter anthoecia continuata, glabra. *Anthoecia* saepe numerosa, dense imbricata, ♀ vel summa plus minusve redacta. *Glumae* spicularum terminalium subaequales et similes, caeterarum inaequales et dissimiles; gluma inferior spiculae terminalis a latere visa oblique lanceolata tenuiter acuta, explanata ovata acuta vel raro subbifida, coriacea, arcte prominenter 5–6-nervia, spicularum lateralium ovata, acuta, mucronata, 1–3-nervia, membranacea, uno latere auriculata, auriculo rotundato rhachin versus spectante; gluma superior spicularum omnium a latere visa oblique lanceolata acuminata, explanata late elliptica, acute acuminata, mucronata, coriacea, marginibus membranaceis, arcte prominenter 6–8-nervia. *Lemmata* acute carinata, a latere visa oblique ovata acuta, explanata late ovata, subobtusa vel obtusa, breviter mucronata, firme chartacea, trinervia, nervis infra medium breviter pilosis exceptis glabra, nervis lateralibus supra medium evanescentibus. *Paleae* lemmatibus paulo breviores, infra medium leviter gibbosae, dorso lanceolatae, bicarinatae, inter carinas ciliolatas profunde concavae. *Lodiculae* duae, cuneatae, minutae, carnosae. *Stamina* 3; antherae lineares. *Ovarium* glabrum; styli distincti; stigmata plumosa, lateraliter exserta. *Caryopsis* oblonga, triquetra, lemmate paleaque laxe inclusa; pericarpium tenuissime membranaceum, plus minusve laxum.—Gramen perenne glaucum; ligulae truncatae, breves, membranaceae; foliorum laminae lineares vel inferiorum lanceolatae, rigidae; panicula e racemis brevibus pedunculatis approximatis composita; racemi primo oblique erecti, demum horizontaliter patentes et disarticulati (?); spiculae arcte congestae, purpureo-variegatae.

Species 1, in Tanganyika Territory.

Heterocarpha Haareri *Stapf et Hubbard*. *Culmi* in rhizomate brevissimo fasciculati, basi firmi atque rigidi, saepe vaginis foliorum annotinorum laxe circumdati, ex nodo secundo saepe ramosi et abhinc per spatium breve arcte foliosi, in caespites laxos intertexti,

*Continued from *K.B.* 1929, p. 87.

tunc erecti vel adscendentes, 9–22 cm. alti, vel interdum elongati, ad 55 cm. alti foliis dissitis, graciles, teretes, glabri laevesque, internodio summo (pedunculo) ad 20 cm. longo. *Foliorum vaginae* tenuiter striatae, firmae, glabrae laevesque vel raro sparse hirsutae, inferiores (annotinae) latae, laxae, pallidae, superiores laxae vel arctae, glaucae ; ligulae ad 2 mm. longae, minute laceratae ; laminae basi abrupte contractae vel sensim in vaginam abeuntes, apice attenuatae, duriusculae, tenuiter acutae vel subacutae, 0·5–10 cm. longae, ad 5 mm. latae, planae vel marginibus involutae,



Heterocarpha Haareri Stapf et Hubbard. 1, Spikelet (× 8). 2, Lower glume of a lateral spikelet (× 6). 3, Lower glume of a terminal spikelet, (× 6). 4, Upper glume (× 6). 5, Lemma (× 6). 6, Palea (× 6). 7, Caryopsis and section of same (× 12).

erectae vel patentes, firmae rigidaeque, glaucae, glabrae vel supra obscure et sparse hirsutae, marginibus et apicem versus minute scaberulae. *Inflorescentia* 1·5–9 cm. longa, secunda ; axis primarius tenuiter striatus, glaber laevisque, internodiis 0·4–1·7 cm. longis. *Racemi* 3–10, 0·8–2·8 cm. longi, conspicue secundi, inferior nonnunquam bractea squamiformi subulato-lanceolata ad 2 mm. longa suffultus ; pedunculi secundarii 1·5–3 mm. longi ; rhachis ad 0·6–1 mm. lata, continua, dorso tenuiter striata ; pedicelli brevissimi. *Spiculae* 5–14 mm. longae, 3·5–6·5 mm. latae. *Glumae* ad carinas scaberulae ; inferior spiculae terminalis 4–6·5 mm. longa, spicularum lateralium 2–3·5 mm. longa ; superior 4–6·5 mm. longa. *Anthoecia* 6–16. *Lemmata* 3–4·5 mm. longa, ad carinas scaberula. *Antherae* 2–2·5 mm. longae. *Caryopsis* 1 mm. longa.

Tanganyika Territory : Pare District ; Kihurio, c. 720 m., Aug. 1928, *Haarer* 1470 ! (type). Nkomazi, c. 780 m., *Haarer*, 1714 !

The strongly compressed many-flowered spikelets bear a distinct resemblance to those of some species of *Eragrostis*, such as *E. superba* Peyr., in which the spikelets fall entire. The manner in which the

spikelets of our genus break up is rather obscure, but it seems certain that they do not disarticulate between the florets.

Of the other genera, which group round *Eragrostis*, *Sclerodactylon* and *Halopyrum* may be mentioned in this place, *Sclerodactylon* differing in its very tough junciform leaf-blades, paired or ternate spikes, one-nerved glumes, glabrous lemmas and paleas with winged keels, whilst *Halopyrum* is distinguished by its less compressed spikelets which readily break up at maturity, by the silky-hairy basal callus of the florets and by the elongated panicle.

Heterocarpha Haareri is named after its collector, Mr. A. Haarer, District Agricultural Officer, who during recent years has done much to increase our knowledge of the flora of the north-eastern section of Tanganyika Territory. The collection in which our new genus was received was composed of plants mostly collected in the Pare District. It included many species, whose area is now considerably extended or is much less discontinuous than formerly appeared to be the case. Among the grasses received were such interesting species as the following :—*Leptochloa Appletonii*, *Eragrostis bifaria*, *Tetrapogon tenellus*, *Schoenefeldia gracilis*, *Oropetium Thomaeum*, *Latipes senegalensis*, *Lintonia nutans*, *Brachiaria serrifolia*, *B. lachnantha*, *Digitaria macroblephara*, *D. Rivae*, *D. pennata*, *Dichanthium papillosum* and *Chrysopogon Aucheri* var. *quinqueplumis*.

XLVII.—MISCELLANEOUS NOTES.

Mr. C. H. Wright, A.L.S., has retired from the post of Assistant at the Royal Botanic Gardens, Kew, after 45 years' service in the Herbarium. He was appointed an Assistant on September 1st, 1884, and retired on reaching the age limit on August 31st, 1929. Before coming to Kew he was an Assistant in the Herbarium and Library at the Botanic Gardens, Oxford.

Among his many activities during the long period of his service at Kew, one of the most important was in connection with the building of the new wing of the Herbarium. Mr. Wright was assigned the task of re-arranging the collections and organising the whole of the moving over of the specimens and arranging them in the new wing—a task for which, by reason of his well-known accuracy and mastery of method, he was particularly fitted. For many years, all the detail work in connection with the receipt and despatch of specimens had been in his hands, and his knowledge of the history of the Herbarium collections has enabled him to render very valuable services to Kew. Another important piece of work which he has carried out has been the reading of the proofs of the African Floras—a task needing meticulous accuracy and attention to detail.

In addition to these many duties he has been able to carry out a considerable amount of systematic research work, about which it is unnecessary to particularise in this note.

His loss at Kew will be felt very greatly, since for many years past he has been in charge of the Palms and Petaloid Monocotyledons and the Ferns and Mosses. As specialists on the Cryptogams are now few in number it will not be easy to find anyone to take Mr. Wright's place in this particular and very important field. In the year 1896 he was awarded the distinction of the Associateship of the Linnean Society. He leaves Kew with the best wishes of all his colleagues that he may fully enjoy the leisure of his retirement.

Retirement of Dr. N. L. Britton.—Dr. N. L. Britton, who has occupied the position of Director-in-Chief of the New York Botanical Garden since 1896, retired from that important post on July 31st, 1929.

The Gardens were established by an Act of the Legislature of the State of New York in 1891, and their development is due to the energy and organizing power of Dr. Britton.

Dr. Britton first visited Kew in 1888, and has been a welcome visitor on many occasions since, especially when accompanied by Mrs. Britton, who is a keen bryologist. The relations between Dr. Britton and Kew have always been of the most cordial nature, and he has generously contributed many specimens to the herbarium, including those from his twenty trips to the West Indies. He has also given us valuable help in the determination of American plants.

We offer him our sincere good wishes for many years of health and happiness, combined with continued botanical activity, in his retirement.

The post of Director-in-Chief of the New York Garden has been offered to and accepted by Dean Elmer D. Merrill, Dean of the College of Agriculture, University of California, and he will take up his new duties on January 1st, 1930.

Dr. Merrill has for many years been a valued correspondent of Kew, both during his time in the Philippine Islands and since his return to Berkeley.

We beg to offer him our sincere congratulations on his new appointment, and look forward with confidence to the continuance of the very valuable and pleasant relations which have existed for so long a time between the New York Botanical Garden and Kew.

The Edible Canna (*Canna edulis* Ker-Gawl.).—This South American plant, which has been known to cultivation in tropical countries for many years under such names as "Edible Canna," "Queensland Arrowroot," "Tous les Mois," etc., has been attracting special attention in certain countries in recent years. Since its introduction to Southern Rhodesia by the Agricultural Department in 1922 it has shown great promise as a stock-food, particularly where pig-raising, dairying, or the fattening of steers is practised. Being fairly drought-resistant and not exacting as to climatic conditions it is proving particularly suitable for Rhodesian conditions, and both the starchy root-stocks and the tops can be fed to stock.

During the last ten or fifteen years a great deal of interest has been taken in the plant in Hawaii as a commercial source of starch. In the Waimea district of Hawaii the repeated failures of most of the staple crops of cultivators were instrumental in a search being made for a crop that could be depended upon as a source of food-stuff. The Edible Canna was found to grow well at the higher altitudes of that district. The ill-effects of strong winds—the only serious drawback—were overcome by growing suitable wind-breaks. Thousands of acres of the uplands, not suited to pineapple and sugar-cane growing, have been found to be suitable for the crop.

As is the case with other root crops the Edible Canna grows most successfully when planted in soil of a loose porous nature containing an abundance of humus. When cultivated in clay soils the tubers are smaller and the yield is considerably reduced, in addition to which the work of harvesting is rendered more difficult. The plant can withstand an excessive amount of moisture in the form of rain-fall or irrigation, provided the area is well drained. In planting, tubers are generally placed at a depth of three to five inches in the soil at distances of three feet in rows three feet apart : this allows of cross cultivation when the plants are young. Periodical cultivation can be carried on for four or five months from planting, after which injury to the spreading growth of the clumps of stalks is likely to occur. However by this time weed growth is generally effectively kept down and smothered by the dense shade of the foliage.

Unless checked by frosts or by lack of moisture the plants will continue to grow indefinitely, and the time of harvesting therefore depends upon the length of the growing season. If the crop is grown as a stock-feed the tubers can be left in the ground and used as required. In starch production the tubers should be milled soon after being removed from the ground, as exposure is likely to have a deteriorating effect on the quality of the starch. Harvesting does not present any difficulty as the tubers are formed in a mass near the surface of the soil and are easily lifted.

Yields are influenced in the main by the fertility of the soil and the period the crop occupies the ground. In Hawaii, where the growing season is more or less continuous, results have been obtained* varying from ten tons of tubers per acre within four months after planting, to thirty-four tons within twelve months after planting, with an average yield ranging from eighteen to twenty tons per acre for eight-month periods. At the Salisbury Experiment Station in Southern Rhodesia, where the growing season is limited, the yields obtained under practical farming conditions were regarded as very favourable, and were in the neighbourhood of six to seven tons per acre (tubers only), seasonal rainfall for the year being only

*"Edible Canna in Hawaii," by H. L. Chung and J. C. Ripperton. Hawaii Agric. Exp. Stn. Bull. No. 54 (1924), 16 pp. (Government Printing Office, Washington).

22·39 inches.* It is reported that in Hawaii from forty to fifty pounds of tubers have been obtained from single ' hills.'

What is regarded as an important feature about the crop is the good keeping qualities of the tubers. These can be stored for several months, provided that any soil adhering to them is removed and that they are dry when put into storage. In this respect it is superior to the Sweet Potato (*Ipomoea Batatas* Poir.), an important stock-feed in Rhodesia at the present time. A point of inferiority compared with the Sweet Potato, however, is that it cannot be propagated from stem cuttings, and quite an appreciable proportion of the crop each year has to be retained for propagating suckers for the following season.

The Edible Canna has been grown in Queensland to a varying extent for upwards of fifty years as a source of starch and for the manufacture of Queensland arrowroot. A peculiarity about the starch is the exceptionally large size of the grains or granules. These are larger than, though morphologically similar to those of the potato, and very much larger than those of Maize and Cassava. The starch has a glossy appearance, with a decided glisten in certain lights, in marked contrast to the smaller-grained starches which are of a dull amorphous appearance. When cooked it forms a semi-translucent rather sticky mass and is recommended for the use of infants and invalids, due to its large granules.

The small immature tubers are said to resemble white potatoes in taste and consistency when cooked, but soon become too fibrous to be palatable. In the mature state they are little used for human consumption and require to be cooked for a long time. F. N. H.

The Chinese Gooseberry.—This comparatively little-known fruit (*Actinidia chinensis* Planch.) appears to be receiving increased attention in New Zealand, its success being most marked in the northern part of the Dominion.† The oval fruits, about two inches in length, are of a soft pulpy nature when ripe, with minute seeds, and are covered with hair. This hair can be easily rubbed off the fruits before they are fully ripe, at which stage the fruits should be picked. Well ripened fruits are claimed to be luscious with a sweet pleasant flavour, and to be suitable alike for dessert purposes, fruit salads, jam-making, etc. The vine has been found to be of rapid growth in New Zealand and is not exacting as to soil conditions. It was introduced to cultivation in England in 1900 and flowered here for the first time in June 1909. As the plant is for the most part unisexual care has to be taken to have both male and female plants present if fruit is to be expected. Hermaphrodite plants are sometimes met with. F. N. H.

*"The Edible Canna," by D. E. McLoughlin. Rhodesian Agric. Jour. Vol. xxv, No. 6 (June, 1928), pp. 664–674 (Rhodesian P. & P. Co., Ltd., Salisbury, Rhodesia).

†Journal of the New Zealand Institute of Horticulture, Vol. i, No. i, June, 1929, pp. 2–4. "Chinese Gooseberry" (*Actinidia chinensis*) by W. H. Rice.

Cyprian Colocynth.—Colocynth, the pulp of the fruits of *Citrullus Colocynthis* Schrad. has long been used in medicine on account of its powerful cathartic properties. The plant has a very wide range extending from south-eastern Europe to China, though Egypt is probably the chief source of the trade product. An account of the examination and commercial valuations of a recent consignment from Cyprus is given in the Cyprus Agricultural Journal for July, 1929, pp. 797-8. The sample consisted of broken pieces of pulp up to 3 in. in length, almost devoid of seeds and varying in colour from white to greenish yellow. It complied well with the requirements of the British Pharmacopoeia, and, except for the unusual colour and being slightly fibrous, was regarded as comparing favourably with the Egyptian grade. F. N. H.

A First Biology.*—This small introductory text-book of 184 pages is intended to " open the eyes of the pupils to the fundamentals of biology." The subject-matter is arranged under eleven chapter headings " to display the unity of life, and to develop the idea of evolution." It is an excellent sign that the authors have realized the limitations of the type system—so often mis-used in English schools and colleges—and have considered a broader treatment essential. It is again all to the good that such subjects as heredity and evolution are not considered too ' advanced ' for introductory treatment in a book of this standard. Animals and plants are dealt with as parallel groups—a method which must necessarily lead to such essentially biological viewpoints as ecology, genetics, and evolution.

The eighty-nine text-figures are mostly diagrammatic, with little or no shading, and are suitable for blackboard reproduction. With its broad treatment and, with few exceptions, accurate and up-to-date details this book can be thoroughly recommended to teachers in all parts of the British Empire. A second, more advanced, part is promised for the immediate future. W. B. T.

Botanical Magazine.—The first part of Volume cliii (1927) of the Botanical Magazine has now been published and contains eleven plant portraits. Two of them are of striking hybrids of considerable horticultural value, one being x *Crinodonna Corsii* (t. 9162), a hybrid raised by fertilizing flowers of *Amaryllis Belladonna* with the pollen of *Crinum Moorei* ; the other x *Salvia superba* (t. 9169). The latter is a well-known garden plant, cultivated generally under the name *Salvia nemorosa*, and has been a conspicuous feature at Kew for many years. The assumed parents of this sterile hybrid are *S. silvestris* Linn. and *S. villicaulis* Borbás. The other plants figured are :—*Picea omorika* Bolle (t. 9163), a valuable spruce for the neighbourhood of London, which does not suffer from chermes.

*By S. Mangham and W. Rae Sherriffs. Sidgwick & Jackson Ltd., 44, Museum Street, London, W.C. 1, 1928, pp. viii + 184, text figs. 89, price 2*s.* 6*d.*

Figure 4 on the plate, it should be noted, represents an anther which by a printer's error reads "another." *Eustephia Pamiana* Stapf (t. 9164) is a new species of this genus of the *Amaryllidaceae*, native of Tucuman in the Argentine, named in honour of Major Pam who flowered bulbs received from Tucuman in 1926. *Rhododendron haematodes* Franchet forms the subject of plate 9165; it was introduced to cultivation in this country by Mr. Forrest from the mountains above Tali, West Yunnan. *Primula vulgaris heterochroma* W. W. Smith & Forrest (t. 9166), is an interesting Primrose from the southern coast of the Caspian, resembling in habit our British plant, and promises to be an interesting garden plant. *Carduncellus multifidus* Coss. & Dur. (t. 9167), is an interesting thistle-like plant from N. Africa introduced by Mr. E. A. Bowles. The next plate (t. 9168), represents *Corokia macrocarpa* T. Kirk, a native of Chatham Island. The Costa Rican orchid *Epidendrum pumilum* Rolfe forms the subject of plate 9170; it belongs to the group having the column continued into three lobes which surround the broad clinandrium like a cuff. *Cotoneaster glaucophylla* Franch. f. *serotina* is represented in plate 9171, and is found in Western Yunnan. The doubts which have existed as to the two species *C. serotina* Hutchinson in Bot. Mag. t. 8854 and *C. glaucophylla* Franch. are settled in the text relating to this plate. *Acacia extensa* Lindl. (t. 9172) is the final picture in this part and comes from the mountains of the N.W. corner of Western Australia. The plant has been grown for many years in the Temperate House at Kew whence the flowering material for the Plate was provided.

Forest Trees.*—In the Translator's Preface it is stated that "there is, so far, no book dealing comprehensively with the structure and life of forest trees . . . no work collects together in one volume the results of past researches in this field with reference to the original papers." It is to fill this gap that Büsgen's book has been translated into English.

The work, in general terms, is in the nature of an advanced book dealing with botany as the basis of the study of the living tree, but treating of the aspects most relevant to the life of the tree in a detailed manner. The structure and function of the individual is explained, and its origin and development under internal and external influences. The examples generally given are trees of the North Temperate Region.

Some chapters carry the subject from botany into the more technical sphere, where, as in Chapter VII, the anatomical basis of the technical properties of timbers follows the botanical treatment of the general structure and growth of the stem.

*"The Structure and Life of Forest Trees," by Büsgen, Third edition by Münch translated into English by T. Thomson. Chapman & Hall, Ltd., 11, Henrietta Street, London, W.C. 2, 1929, pp. xi + 436; figs. and plates 173. Price 30*s*.

Many problems connected with the growth of trees are discussed and others, of which no explanation is as yet forthcoming, are indicated.

The value of a book of this nature outside the libraries of the limited number of Schools of Forestry is somewhat doubtful. The treatment of the botanical portion is too advanced to permit a forester to forego instruction in botany; on the other hand, a student, with an efficient training in botany, should not require the repetition here of matter which he has found in botanical text-books. The system of presenting each subject in the form of a résumé of research work, whilst enhancing the value of the book as a work of reference, limits its general usefulness, owing to its size and the extended treatment of each subject.

The photographs, unfortunately, have not been well reproduced, and in most cases permit only an outline of the subject depicted to be seen whilst the detail of the picture is lost.

The Key to trees by their buds (p. 79) and the Key to the anatomical structure of timbers (p. 131) are helpful and more aids in this direction would have been useful.

There is a wealth of information about every part and function of the common trees of the Northern Hemisphere, and the comprehensive indices facilitate easy reference. The translation has been carried out freely so that the reading is easy and is not hampered by technical expressions and names in the original language.

The Translator must be congratulated on his energy and perseverance in achieving the publication in English of such an intensive study which includes a mine of detailed information.

A Local Flora for Madras City.*—The object of this work is to assist the amateur and the student of botany to identify the plants found in and around the City of Madras in South India. The arrangement is that of the *Genera Plantarum* but the taxonomy is more up to date. An original key to the families and aberrant genera is provided and seems efficient; together with the generic and specific keys to be found under the families and genera containing more than one genus or species respectively, they should make determination an easy matter for anyone. Technical terms have been avoided as far as possible, but considerations of space render a moderate use unavoidable and so a glossary of the terms employed is added. Brief but sufficient descriptions of families, genera and species are included so that the determinations arrived at by the keys can be checked. Elaborate synonymy would be out of place in a work of this nature and has been wisely omitted; the few

*"The Flowering Plants of Madras City and its immediate neighbourhood," by P. V. Mayuranathan, B.A., Botanical Assistant, Madras Government Museum.—Bulletin of the Madras Government Museum, New Series, Natural History Section. Vol. III. 4to, pp. 1–335, pl. 1–38. Government Press, Madras. Price (paper covers) Rs. 8.

alternative botanical names given are those used in the Flora of British India when they differ from those now accepted. The English, Tamil and Telugu names when known are given, as well as the months of flowering, the situations in which the species is found, and a brief note of uses. General distribution beyond the area is not quoted but the native country of exotics is stated. All wild flowering plants (except grasses) known to occur in the area covered are included as well as aliens that have more or less established themselves and many of the exotics commonly grown in gardens and avenues. The total number of species is 828, of which 197 are illustrated by good line drawings in 38 plates at the end of the volume, which should further facilitate correct naming. To arrive at these figures the separate citations had to be counted; it would be an improvement if they were serially numbered. The volume is rather ponderous and might well have been reduced in size by the use of smaller type and thinner paper. On the other hand the figures might usefully be larger; this could have been effected without increased space by placing fewer on a page and printing the names on the same side instead of marooning them in 4 to 8 lines in the middle of a sheet the reverse of which is left blank. There are a few typographical errors but these minor defects do not really detract from a praiseworthy piece of work, excellently turned out, which meets a definite want and on which the author, the Government Museum, and the Press are to be congratulated. C. E. C. F.

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